3.8 Hydrology and Water Quality

This section contains a description of the environmental and regulatory setting and potential impacts associated with construction and operation of the proposed project and alternatives with respect to hydrology and water quality. Water resources that would be used during construction and operation and maintenance are also discussed.

3.8.1 Environmental Setting

3.8.1.1 Surface Water Resources and Flooding

The proposed project site is in the western portion of the Basin and Range Physiographic Province in southeastern California and southwestern Nevada. Basins are valleys or depressions juxtaposed to mountainous terrains. A typical elevation difference between the two is about 4,000 vertical feet (see Figure 3.8-1). The province, which covers an area from central Utah to eastern California, may have been created by crustal extension, which produced vertical faults along which the basins and ranges developed (Blakley et al. 2000).

The proposed project area includes two basins, the Eldorado Valley and the Ivanpah Valley, and three mountain ranges, which are (from east to west) the Highland Range, the McCullough Range, and the Lucy Gray Mountains. Within Eldorado Valley, the proposed project crosses or is relatively close to Eldorado Dry Lake (in the northern part of Eldorado Valley) and at least 15 dry washes. A dry wash, or desert wash, is a gravelly, dry bed of an intermittent stream that usually only flows during precipitation events. In Ivanpah Valley, the proposed project crosses Ivanpah Dry Lake and is relatively close to Roach Dry Lake, Jean Dry Lake, and at least 15 dry washes (see Figure 3.8-2). There are likely many more dry washes within the proposed project area that are unmapped and could be impacted by the proposed project. In hydrological terms, basins are areas drained by a single major river or a more complex drainage system comprised of several surface water features such as rivers and lakes, principally dry lakes (lakes that receive surface water from desert washes in an internal drainage setting, then evaporate back into the atmosphere and/or contribute to groundwater). Basins can be divided into sub-basins, which in turn are divided into consecutively smaller units such as watersheds, subwatersheds, and catchments. Annual precipitation in these watersheds is quite low, ranging from 4 to 10 inches (California Department of Water Resources [CDWR] 2004, Nevada Department of Air Quality and Environment Management [NDAQEM] 2009). Surface water within the watershed drains into a number of dry lakes. Dry lakes are ephemeral water features; in the project area, they are located in the central valley (NDAQEM 2009).

The surface of the proposed project site contains desert scrub vegetation, desert washes, and dry lakes. More than 90 percent of the site is sparsely to moderately vegetated, with the remaining area made up of dry lakes, desert washes, and disturbed (human-made) areas that consist of roads and sediment berms. Alluvium in the area is composed of clay, sand, and gravel material. The soils and alluvium are highly susceptible to erosion as evidenced by incised scouring and braided drainage channels.

The desert washes, which are typical in the Mojave Desert region, are braided (streams that exhibit numerous channels that split off and rejoin each other to give a braided appearance). These streams flow only intermittently during seasonal precipitation events. Such streams are unstable and can migrate laterally during significant runoff occurrences. Water in the project area commonly flows into dry lakes. It is also possible for water in the dry washes to flow to perennial streams during significant precipitation events. Generally, significant drainage in the area appears to be internal; that is, dry washes transport water to dry lakes, where the water either evaporates or contributes to groundwater.

Dry washes can also carry destructive bedloads (boulders and gravels) during rain events. The portion of the proposed project located in Clark County, Nevada, has been mapped as primarily outside the 100-year and 500- year floodplains, with the exception of the dry lakes that are mapped as Federal Emergency Management Agency (FEMA) Zone A, within the 100-year floodplain. The portion of the proposed project in San Bernardino County, California, is mapped as FEMA Zone D, indicating that there are possible but undetermined flood hazards in the area.

Geologically, the site is located on a series of alluvial fan lobes that form large cone-shaped sedimentary deposits. This is a common depositional environment in this region (Reading 1980). It is likely that most of the proposed project area is on alluvial fans that have originated from significant amounts of flowing water carrying and subsequently depositing sediments across their entire extent during their lifespan. The hydrologic processes that occur on alluvial fans can be random and difficult to model. Sediments, which can range from clay to large boulders, are transported across alluvial fans by water in desert washes, debris flows, and sheet floods. Flood events on alluvial fans in arid climates are triggered by significant storms. In the Mojave Desert region, these would include the random summer cloudbursts that occur infrequently but can supply a large amount of water to a small area, as well as larger storms such as tropical storms that occur on a 100-year time scale. Any of these storms could result in flooding that could cause significant damage across the proposed project area and could cause significant localized destruction.

A specific approach to understanding and assessing flood hazards on alluvial fans has been developed for arid alluvial fans near Laughlin, Nevada. This approach uses geologic mapping to determine active and inactive portions of alluvial fans. Physical features such as stratigraphic relationships, topography, drainage patterns, soil development, and surface morphology are used to determine active and inactive portions of fans (House 2005). Certain portions of alluvial fans can become inactive and remain inactive for thousands of years. Those areas would be considered suitable for building. Conversely, very active portions of alluvial fans may need additional hydrological surveys and appropriate engineering controls to assure that any impacts to the public and the environment would be within acceptable constraints. This approach may improve the accuracy of surface water modeling on alluvial fans and reduce the associated flood hazards.

3.8.1.2 Surface Water Quality

Although ephemeral streams and washes do not have beneficial use designations assigned by the states of California and Nevada, these systems do provide natural distribution of water and sediments on floodplains, recharge for groundwater in the region, and a sporadic but local water supply for wildlife. No information is available on the surface water quality at the site during rain events, but the nature of the flooding that occurs there would tend to result in flood waters of high turbidity. Highly turbid waters would be more able to contain any contaminants that had been present on the soil surface. As this is a rural, undeveloped area, anthropogenic contaminants on the surface are expected to be low to non-existent.

3.8.1.3 Groundwater Resources

The proposed project site lies within the Basin and Range Physiographic Province, which has principal aquifer media of volcanic rocks, carbonates, and basin-fill sediments. Together, these aquifers are called the Basin and Range Aquifer System. The Basin and Range Physiographic Province is divided into hydrographic basins at the regional level, depending on geologic drainage features such as the drainage boundaries of a large river or stream.

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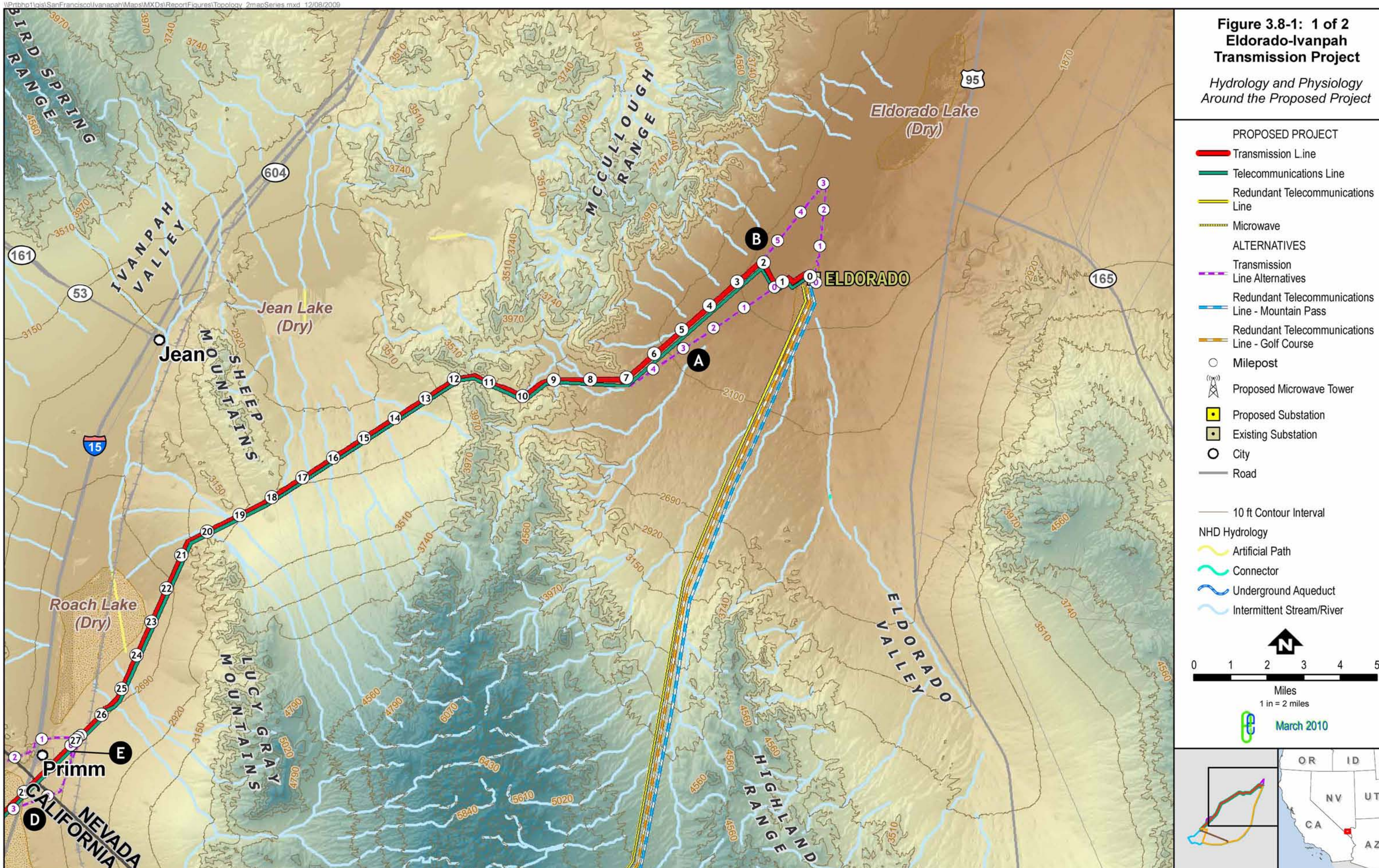

Figure 3.8-1: 1 of 2
Eldorado-Ivanpah Transmission Project

Hydrology and Physiology Around the Proposed Project

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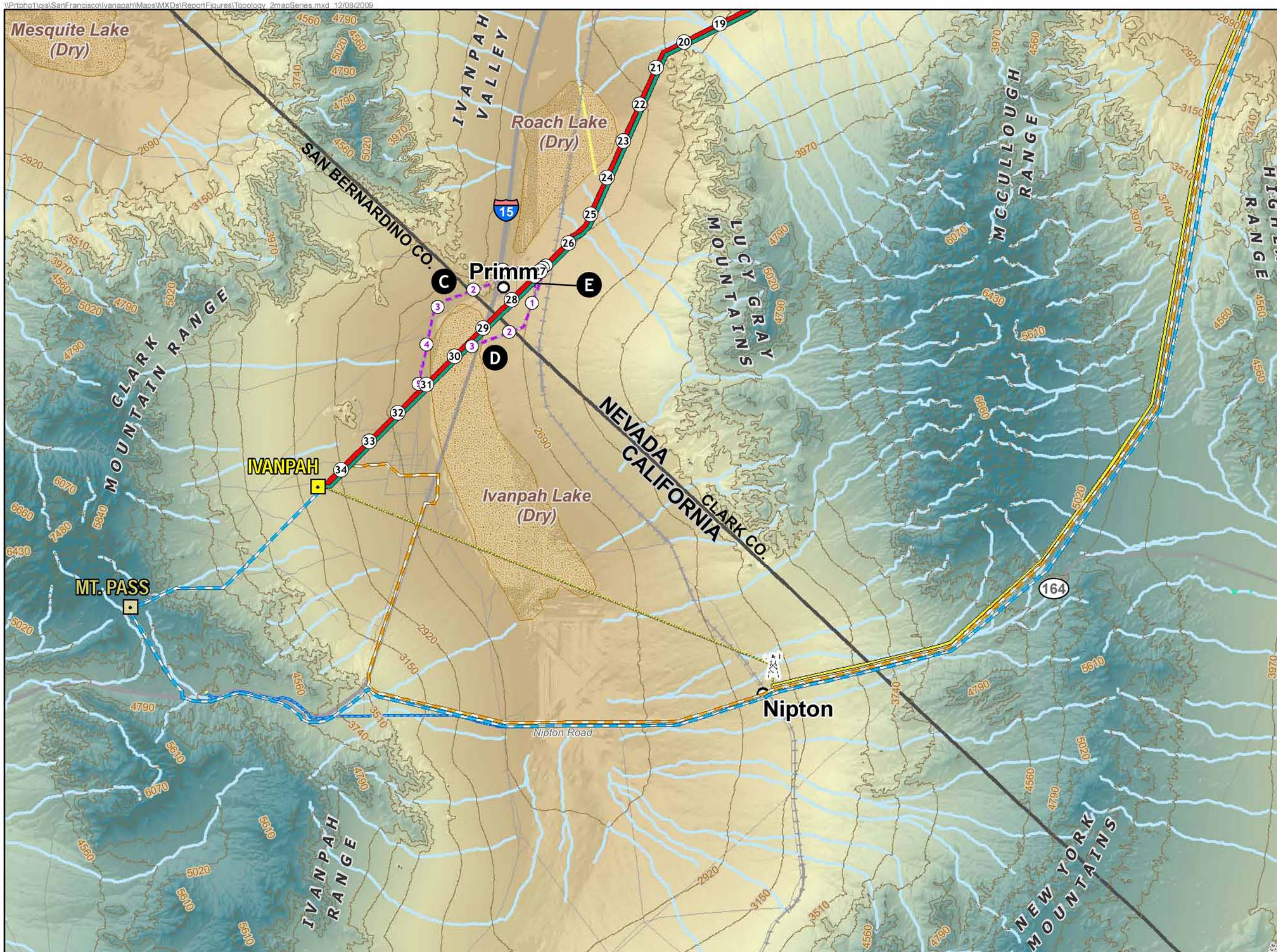

Figure 3.8-1: 2 of 2
Eldorado-Ivanpah Transmission Project

Hydrology and Physiology Around the Proposed Project

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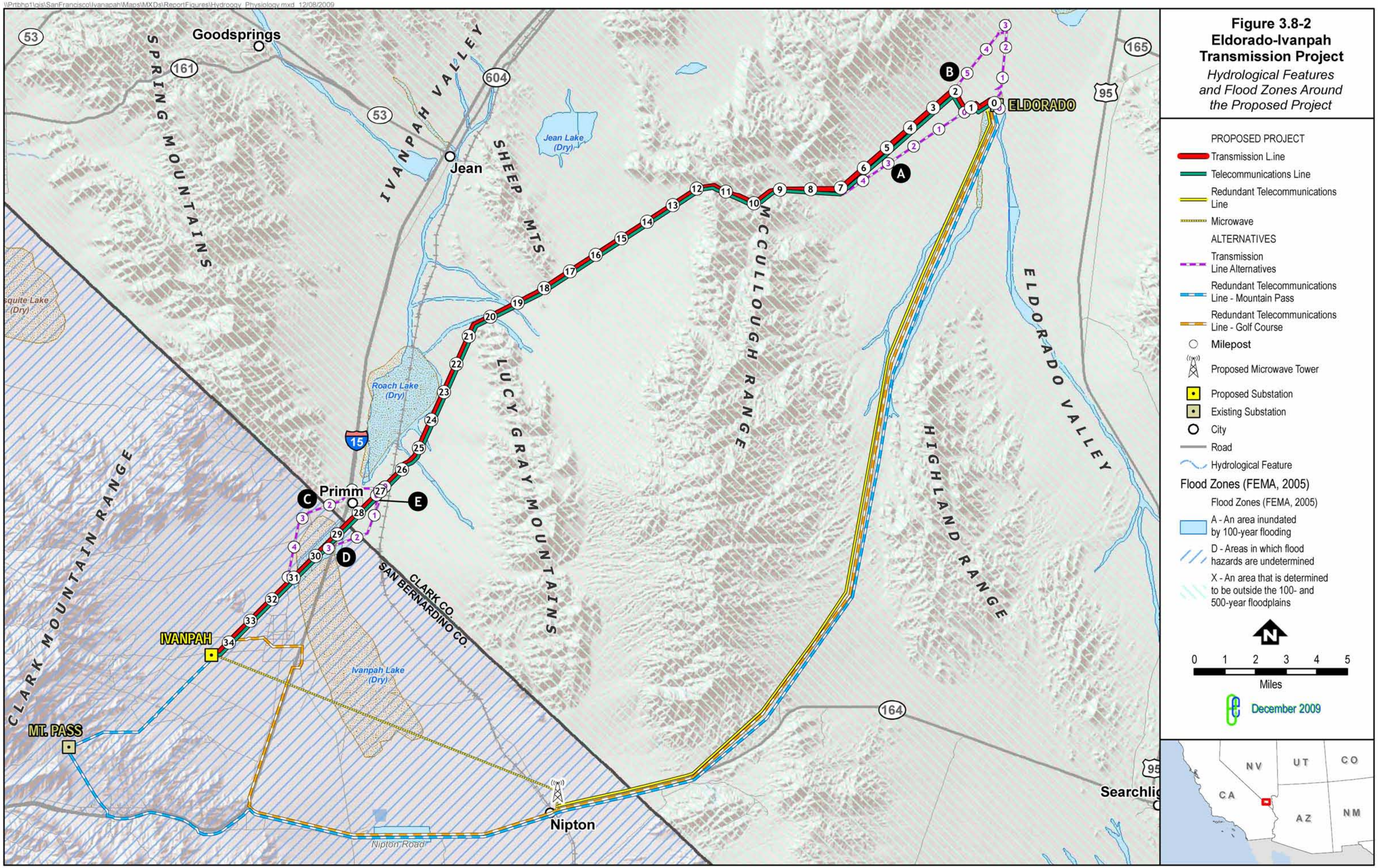

Figure 3.8-2
Eldorado-Ivanpah Transmission Project
Hydrological Features and Flood Zones Around the Proposed Project

Four groundwater basins underlie the proposed project area. Three are solely in Nevada, and one connects California and Nevada as shown in Figure 3.8-3 (CDWR 2004, NDCNR n.d.). In general, the groundwater basins lie beneath the Ivanpah and Eldorado desert valleys and are confined by local mountain ranges. Smaller portions of the proposed project facilities span the Jean Lake Valley and the Piute Valley groundwater basins. Recharge is primarily via percolation through alluvial deposits at ephemeral washes and the bases of neighboring mountain ranges. The coarse-grained alluvial deposits allow for infiltration of water during precipitation events. In Basin and Range aquifers, water is withdrawn primarily for agricultural uses (77 percent in 1985). Other uses include public supply (18 percent), mining, industrial, and thermoelectric power use (4 percent), and domestic and commercial use (1 percent; Planert and Williams 1995).

All of the sub-basins crossed by the Nevada portion of the proposed project are designated groundwater sub-basins that require additional administration to protect groundwater resources and declare preferred uses.

The Ivanpah Valley Groundwater Basin spans over 630 square miles across the California-Nevada state line. In California, basin number 6-30 is located in the eastern part of the South Lahontan Hydrologic Region. In Nevada, Ivanpah Valley Northern (164A) and Southern (164B) basins are in the southwestern part of the Central Hydrologic Region. This basin is confined by the Clark Mountains to the northwest, the Ivanpah Range to the west, the New York Mountains to the southwest, and the Lucy Gray Mountains to the east. This groundwater basin consists of Quaternary alluvium deposits up to 825 feet thick bound by northwest-trending faults. As with surface drainage, groundwater flows northward and is discharged via pumping and flow to Las Vegas Valley (CDWR 2004).

The Jean Lake Valley Groundwater Basin (basin 165) covers 96 square miles in the Central Hydrographic Region. This basin is confined by the Sheep Mountains and Lucy Gray Mountains to the west, the McCullough Range to the east, and the Bird Spring Range to the north. Water is withdrawn primarily for mining and milling processes. A small amount is withdrawn for stockwater (NDCNR n.d., NDWR 2009).

The Piute Valley Groundwater Basin (basin 214) covers 331 square miles in the Colorado River Basin Hydrographic Region. This basin is confined by the McCullough Range on the northwest, the New York Mountains and Castle Mountains on the west, and the Highland Range, Newberry Mountains, and Dead Mountains on the east. This basin crosses into California. Water is withdrawn primarily for municipal use. Small amounts are withdrawn for quasi-municipal use, mining and milling processes, stockwater, and commercial use (NDCNR n.d.).

The Eldorado Valley Groundwater Basin (basin 167) covers 530 square miles in the Central Hydrographic Region. This basin is confined by the Highland Range on the southwest, the McCullough Range and Black Mountains on the northwest, and the Eldorado Mountains on the east. Water is withdrawn primarily for mining and milling processes. Smaller amounts are withdrawn for municipal use, stockwater, and industrial use (NDCNR n.d.).

3.8.1.4 Groundwater Quality

Groundwater quality in the Basin and Range aquifers varies by basin. Generally, groundwater quality is high near the alluvial fan deposits at the base of mountain ranges. Groundwater quality decreases where increased discharge or excessive evaporation in confined basins resulted in salination of groundwater (Planert and Williams 1995).

One U.S. Geological Service (USGS) monitoring well is present near the proposed project area near Jean, Nevada. The well has been monitored since September 1990. Typical well elevations are between 535 and 595 feet below ground surface. This well samples the Ivanpah Valley sub-basin of the Basin and Range Aquifer (USGS 2009).

Water Supply Wells and Springs

Table 3.8-1 identifies water supply wells and springs/seeps within 1 mile of the proposed project and alternatives. These wells span the four groundwater basins described above. Water supply wells and springs are also displayed in Figure 3.8-3.

Table 3.8-1 Water Supply Wells and Springs/Seeps within 1 Mile of the Proposed Project and Alternatives

Alignment	Number of Wells and Springs
Eldorado–Ivanpah Transmission Line	52
Telecommunications Line	20
Ivanpah Substation	0
Transmission Alternative A	5
Transmission Alternative B	8
Transmission Alternative C	37
Transmission Alternative D	25
Transmission Subalternative E	24
Telecommunication Alternative (Golf Course)	35
Telecommunication Alternative (Mountain Pass)	38

No U.S. Environmental Protection Agency (U.S. EPA)-designated sole-source aquifers would be crossed by the proposed project in either California or Nevada. Sole-source aquifers are groundwater basins that supply at least 50% of the drinking water in the area overlying the aquifer and are in areas where there are no alternative drinking water source(s) available that could physically, legally, and economically supply all drinking water needed (U.S. EPA 2008).

3.8.1.5 Water Use and Discharge

The applicant has indicated that water would be used for dust suppression in daily construction activities and for sanitary and fire suppression purposes during operation of the Ivanpah Substation. The applicant has been requested to prepare a Water Use Plan, through mitigation measure W-2, that identifies sources and quantities of water to be used in these activities. It is anticipated that wastewater in the region would increase significantly if the Southern Nevada Supplemental Airport is built. In 2006, the wastewater treatment facility in Primm had a daily flow of 0.48 million gallons per day (mgd). If the Ivanpah airport is developed fully, it is projected that a maximum of 40 million passengers per year would pass through the airport, which would increase wastewater generation by 0.78 mgd. However, this wastewater would be treated on the airport site, not at the Primm wastewater treatment facility.

Presently, a maximum of 252 acre-feet per year (acre-ft/yr) of water is reclaimed/recycled from non-potable sources in the Primm area. Some of this could be used for the Bighorn Power Plant, a 580-MW combined-cycle gas-fired power plant located in Primm. The Bighorn Power Plant currently uses reclaimed water supplied by the Primm wastewater treatment plant as its primary water source (NDEP 2008). An additional 3 acre-ft/yr is supplied by a groundwater well on the power plant site.

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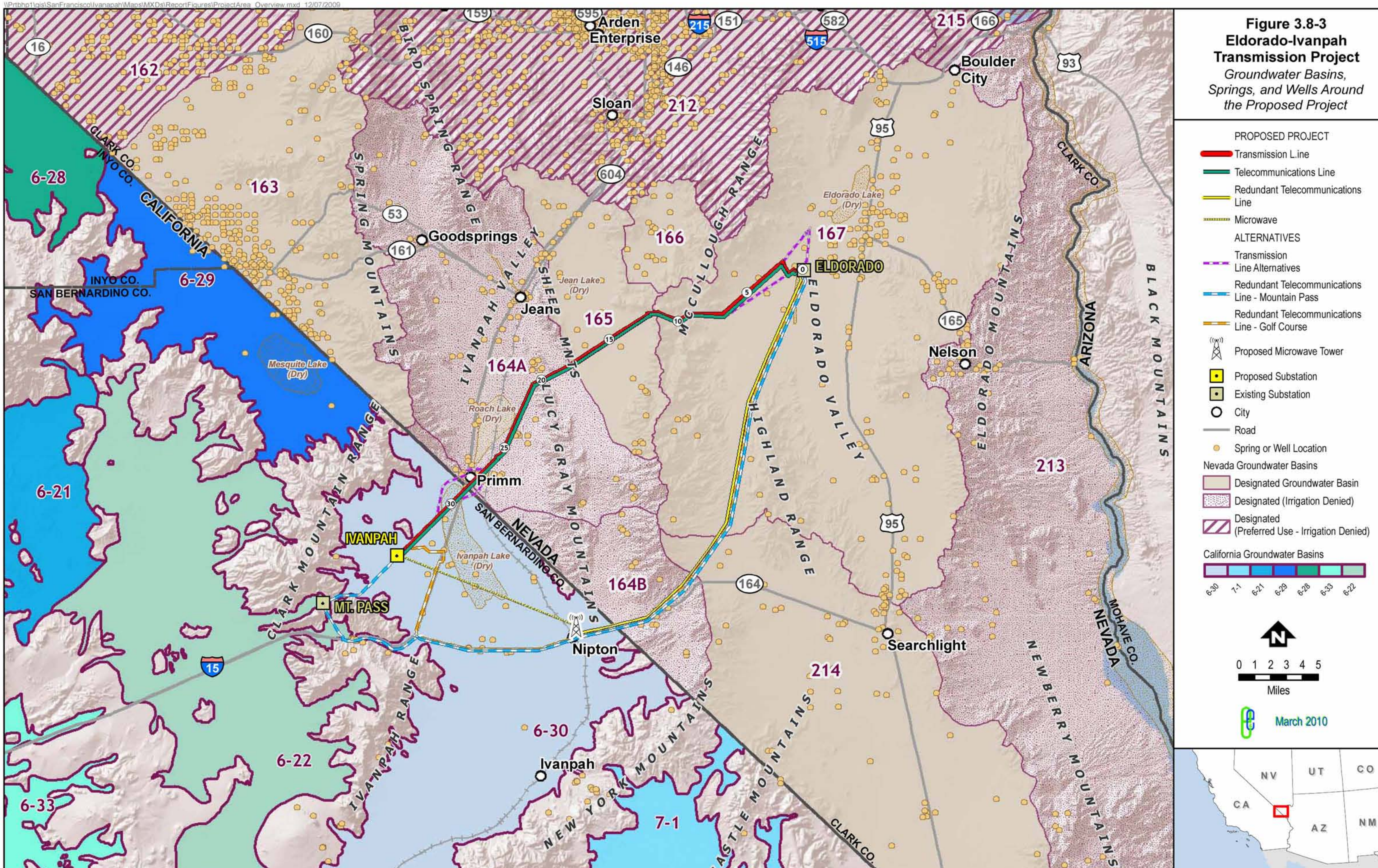

Figure 3.8-3
Eldorado-Ivanpah Transmission Project
Groundwater Basins, Springs, and Wells Around the Proposed Project

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3.8.2 Applicable Laws, Regulations, and Standards

3.8.2.1 Federal

Clean Water Act

In 1972, Congress passed the Federal Water Pollution Control Act, which was reauthorized in 1977, 1981, 1987, and 2000 as the Clean Water Act (CWA). The goal of the law is to eliminate pollution in the nation's waters by imposing uniform standards on all municipal and industrial wastewater sources based on the best available technology.

Sections 301 and 402 Permitting

Sections 301 and 402 of the CWA prohibit the discharge of pollutants from point sources to "Waters of the U.S.," unless authorized under a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permits can be issued by the U.S. EPA or by agencies in delegated states. The NPDES permit program has been delegated in California to the State Water Resources Control Board (SWRCB) and in Nevada to the Bureau of Water Quality Planning.

Safe Drinking Water Act

This act was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources, which are rivers, lakes, reservoirs, springs, and groundwater wells. This act authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and manufactured contaminants that may be found in drinking water. The act also mandates a Groundwater/Wellhead Protection Program be developed by each state to protect groundwater resources that are a source for public drinking water.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) is administered by the FEMA, a component of the U.S. Department of Homeland Security. The NFIP is a federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding.

In support of the NFIP, FEMA identifies flood hazard areas throughout the U.S. and its territories by producing Flood Hazard Boundary Maps, Flood Insurance Rate Maps, and Flood Boundary and Floodway Maps. Several areas of flood hazards are commonly identified on these maps. One of these areas is the Special Flood Hazard Area, a high-risk area defined as any land that would be inundated by a flood having a 1 percent chance of occurring in any given year (also referred to as the base flood).

Participation in the NFIP is based on an agreement between local communities and the federal government. The agreement states that if a community adopts and enforces a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the federal government will make flood insurance available to the community.

3.8.2.2 State

Governing Agencies

In California, water resource supplies are regulated by the SWRCB and Regional Water Quality Control Boards (RWQCBs). Water resource quality is regulated by the California Department of Public Health Drinking Water Source Assessment and Protection Program. State water quality standards allow waterbodies to be managed by establishing goals based on (1) designated uses of the water, (2) criteria set to protect human and aquatic organism health, and (3) anti-degradation requirements to prevent current water quality from deterioration. Waters listed as "impaired" do not fully support their designated uses. Section 305(b) of the CWA requires states to submit water quality reports to the EPA every two years that provide a state-wide assessment of all waters. Section 303(d) requires states to provide a list of impaired waters only, identifying possible pollutants and prioritizing those waters for further pollution controls.

Natural resources in the State of Nevada are managed by the Department of Conservation and Natural Resources. Water resources are regulated by Nevada Division of Water Resources (NDWR), which is part of the Department of Conservation and Natural Resources. NDWR has defined a number of goals and objectives to conserve and manage Nevada's water resources for the citizens of Nevada. The Water Rights Section maintains a detailed Water Rights database and quantifies existing water rights, determines whether adequate water is available for new developments, manages surface and flood control, and manages and issues permits for the use of all water rights within the state. NDWR manages both surface and subsurface water rights. Water pollution and permitting are managed by the Nevada Division of Environmental Protection.

Statutes and Regulations

California Porter-Cologne Water Quality Control Act

This act was passed in 1969. It regulates surface water and groundwater within California and assigns responsibility for implementing CWA §401 through 402 and 303(d). It established the SWRCB and divided the state into nine regions, each overseen by an RWQCB. The SWRCB is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, but much of its daily implementation authority is delegated to the nine RWQCBs. In California, the proposed project area is administered by the Lahontan RWQCB (LRWQCB), Region 6, in San Bernardino County. The regional board governs protection of surface waters by assessing attainment of designated beneficial uses. Currently, 23 uses are established for surface waters within the state.

Nevada Revised Statute 444A.420 and Nevada Administrative Code 445A.118-225

The Nevada Revised Statute and Administrative Code laws regulate surface water within the state and assign responsibility for implementing CWA §401 through 402 and 303(d) in Nevada. The Nevada Bureau of Water Pollution Control is the state entity in charge of governing the water statutes. Nevada establishes both numeric and narrative water quality standards for surface waters. None of the drainage features encountered by the project in Nevada have established numeric water quality standards. However, Roach and Ivanpah dry lakes and all ephemeral washes must meet narrative water quality standards, which primarily address protection of the features from pollutants and toxics (Heggeness 2008).

Construction General Stormwater Permit

CWA §402 regulates construction-related stormwater discharges to surface waters through the NPDES program. In California, the EPA has delegated to the SWRCB the authority to administer the NPDES program through the RWQCBs, and has developed a general permit for Storm Water Discharges Associated with Construction Activities, the Construction General Permit (Water Quality Order 99-08-DWQ). Because the proposed project would disturb more than 5 acres, the applicant is required to obtain an NPDES Construction General Permit from the SWRCB, which requires them to prepare a SWPPP or obtain individual stormwater permits. The proposed project area is under the jurisdiction of the LRWQCB; therefore, the LRWQCB would need to be notified of the applicant's intent to proceed. No specific California SWRCB regulations exist pertaining to the treatment of fuel spills during construction, although petroleum-contaminated materials must be disposed of in accordance with applicable state and local regulations.

The Nevada Division of Environmental Protection (NDEP) has been delegated the authority by the EPA to administer the NPDES program in Nevada, through the Bureau of Water Pollution Control, which manages construction stormwater permits. The construction stormwater permit is required for all sites larger than 1 acre. A waiver is possible if the site is less than 5 acres and meets certain stipulations. The permit requires applicants to prepare and enforce a SWPPP during construction. Industrial stormwater permits and septic system permits are also managed under NDEP. No specific Nevada regulations exist pertaining to the treatment of fuel spills during construction, although petroleum-contaminated materials must be disposed of in accordance with applicable state and local regulations.

Groundwater Protection Areas and Wellhead Protection

The overall concept behind wellhead protection is to develop a reasonable distance between point sources of pollution and public drinking water wells so that releases from point sources are unlikely to impact groundwater from the well. The California Department of Public Health established the Drinking Water Source Assessment and Protection Program, which guides local agencies in protecting surface water and groundwater that are sources of drinking water. The California Department of Pesticide Regulation's Groundwater Protection Program is charged with identifying areas sensitive to pesticide contamination and develops mitigation measures and regulations to prevent pesticide movement into groundwater systems. In Nevada, the NDEP administers the Wellhead Protection Program, which is developed and implemented at the local level, such as the public water system, city, or township (Clark County 2008). The NDEP offers guidance to the local districts, endorses local wellhead protection programs, enforces regulatory setbacks to protected groundwater and wellhead areas, and tracks specific areas delineated as wellhead and source water protection areas.

3.8.2.3 Regional and Local

Basin management for the proposed project area is administered by the Mojave Water Agency in San Bernardino County and the Southern Nevada Water Authority in Clark County. The Mojave Water Agency Regional Water Management Plan was developed in 1994 and is still in place (CDWR 2004). A primary mandate of these entities is to ensure long-term public water supply by protecting surface water and groundwater resources, including supply, storage, recharge capability, and chemical quality. The applicant would confer with the Mojave Water Agency and Southern Nevada Water Authority during implementation of the proposed project to ensure protection of groundwater resources and compliance with any established groundwater management plans, and, if necessary, to secure permits needed for encroachment on water district easements. The applicant would also confer with the Clark County Water Management Team.

San Bernardino County

Floodplain Management

The San Bernardino County Flood Control District was formed as a progressive measure to preserve and promote public peace, health, and safety in the aftermath of disastrous 1938 floods. The district exercises control over all main streams in the county, acquires a right-of-way (ROW) for all main channels, constructs channels, and carries out an active program of permanent channel improvements in coordination with the U.S. Army Corps of Engineers (USACE). The district administers encroachment permits needed for flood channel crossings or any work within the district's ROW, if they are required.

Stormwater Management

The LRWQCB requires the unincorporated areas of San Bernardino County and the San Bernardino Flood Control District, as permittees, to be included in the NPDES Municipal Stormwater Permit. The Municipal Stormwater Permit and §4 of the Report of Waste Discharge, dated April 1995, require the development and adoption of New Development/Redevelopment Guidelines (the Guidelines).

The Guidelines are to be used by the permittees of the San Bernardino County Stormwater Program as a supplement to the Drainage Area Management Program and the Report of Waste Discharge. The purpose of preparing the Guidelines was to identify pollutant prevention and treatment measures that could be incorporated into development projects. The Guidelines recommend which Best Management Practices (BMPs) should be required as standard practice. The Guidelines provide information on stormwater quality management planning, general conditions, special conditions, and construction regulatory requirements.

Currently, the County of San Bernardino does not have its own specific standards but follows state standards for water quality. During construction, projects are required to obtain coverage under the California General Permit for Construction Activities, which is administered by the RWQCB. Projects must identify and implement stormwater management measures that would effectively control erosion and sedimentation and other construction-based pollutants during construction. Projects must also identify and implement other management measures, such as construction of detention basins, that would effectively treat pollutants expected for the post-construction land uses.

All future individual construction projects over 1 acre that are implemented under the County of San Bernardino General Plan will be required to have coverage under the California General Permit for Construction Activities (County of San Bernardino 2007). As required in the General Permit for Construction Activities, during and after construction, BMPs would be implemented to reduce or eliminate adverse water quality impacts resulting from development. Compliance with applicable state and local water quality regulations would ensure that impacts to water quality would be less than significant.

Clark County

Floodplain Management

The Clark County Regional Flood Control District has a comprehensive floodplain management plan in place that includes a regulatory program that establishes standards and requirements for flood hazard management. The county has adopted revised regulations, the Uniform Regulations for the Control of Drainage, that comply with national FEMA standards and provide regulatory control over land development in floodplain areas. These regulations outline when and where a Floodplain Use Permit is required, as well as the process for review of local development permit applications in compliance with these regulations (Clark County Regional Flood Control District 2007).

Stormwater Management

A Stormwater Quality Management Committee has been formed as a partnership entity among the cities of Las Vegas, North Las Vegas, and Henderson; Clark County; and the Clark County Regional Flood Control District. The committee manages stormwater program development and compliance efforts in accordance with the State of Nevada's NPDES program. For inclusion of a project under the state's General Stormwater Permit, project proponents must submit a notice of intent and a SWPPP for all soil-disturbing activities. The criteria for soil-disturbing activities includes those where 1 or more acres will be disturbed, stormwater (free flow or via storm drains) will be discharged to a natural receiving water, and/or detention basins will need to be constructed for onsite stormwater treatment (Clark County Stormwater Quality Management Committee 2009).

Local

The Clark County Department of Air Quality and Environmental Management oversees environmental issues in the county. The Water Quality Planning Team, which is part of this group, is responsible for ensuring compliance by area permittees for projects that could have an impact on county surface water and groundwater. The group's primary responsibility is to develop and ensure compliance with area-wide water quality management plans. The group deals with issues such as municipal wastewater treatment, stormwater pollution prevention, groundwater management, and wellhead protection. The county also has a federal lands program to coordinate with the six federal agencies and monitor National NEPA planning.

To accomplish the goals noted above, the Clark County Area Wide Water Quality Management Plan (WQMP) was established in 1975. This bill enabled certain counties (including Clark County) to complete their own WQMP. The plan was established in 1978 and approved by EPA in 1979, and has been revised and amended, most recently in

2009. The WQMP establishes eight planning areas. The site is contained in Planning Area 6: Ivanpah-Pahrump Valleys. Planning Area 6 covers approximately 1,690 square miles. The major watershed in the area is the Ivanpah-Pahrump Watershed (DAQEM 2009).

Basin management for the Ivanpah Valley (the California portion of the proposed project) is administered by the Mojave Water Agency in San Bernardino County. A Regional Water Management Plan was developed in 1994 and is still in place (DWR 2004). As discussed above, a primary mandate of the agency is to ensure long-term public water supply. The applicant would confer with the Mojave Water Agency during implementation of the proposed project to ensure protection of groundwater resources and compliance with any established groundwater management plans and, if necessary, to secure permits needed for encroachment on water district easements.

3.8.3 Impact Analysis

This section defines the methodology used to evaluate impacts for hydrology and water quality resources, including CEQA impact criteria. The definitions are followed by an analysis of each alternative, including a joint CEQA/NEPA analysis of impacts. At the conclusion of the discussion is a NEPA impact summary statement and CEQA impact determinations. For mitigation measures, refer to Section 3.8.4, “Mitigation Measures.”

3.8.3.1 NEPA Impact Criteria

The NEPA analysis determines whether direct or indirect effects to hydrology and water quality resources would result from the project, and explains the significance of those effects in the project area (40 CFR 1502.16). Significance is defined by Council on Environmental Quality regulations and requires consideration of the context and intensity of the change that would be introduced by the project (40 CFR 1508.27). Impacts are to be discussed in proportion to their significance (40 CFR 1502.2[b]). To facilitate comparison of alternatives, the significance of environmental changes is described in terms of the temporal scale, spatial extent, and intensity.

Under NEPA, effects to water resources would occur if the proposed project would:

a. Degrade the quality of surface waters by increasing erosion or sedimentation or by introducing contaminated waters
b. Result in short- or long-term violations of federal or state water quality standards
c. Alter the flow or degrade the quality of groundwater to natural systems or wells for private or municipal purposes

3.8.3.2 CEQA Impact Criteria

Under CEQA, the proposed project would have a significant impact if it would do any of the following:

a. Violate any water quality standards or waste discharge requirements
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge
c. Substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation onsite or offsite
d. Substantially alter the existing drainage pattern of the site or area or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite
e. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or otherwise substantially degrade water quality

f. Place within a 100-year flood hazard area structures that would impede or redirect flood flows

g. Expose people or structures to a significant risk of loss, injury, or death related to flooding, including flooding as a result of the failure of a levee or dam

h. Cause inundation by mudflow

3.8.3.3 Methodology

This analysis describes the impacts of the proposed project related to water resources for each criterion, and determines whether implementation of the proposed project would result in significant impacts by evaluating effects of construction and operation of the proposed project in the context of the affected environment described in Section 3.8.1.

The purpose of this evaluation was to determine the potential impact to water resources resulting from the proposed project. The impact of random flood events on the proposed project was also assessed, as well as the corresponding impact to public health and the environment. To complete the analysis, published resources including books, journals, maps, and information available via the internet on government websites were reviewed. The PEA was used extensively as a resource document for much of the analysis. In addition, information provided in the Final Staff Assessment/Draft Environmental Impact Statement (FSA/EIS) prepared for the proposed ISEGS located near the proposed Ivanpah Substation was evaluated. Published surface and groundwater maps and reports provided the information for the environmental setting section.

While Section 3.8.1, “Environmental Setting,” identifies resources within the general vicinity of the proposed project, the impact analysis focuses on water resources that are directly crossed by the power lines or telecommunication lines, or are within the area impacted by the Ivanpah Substation, or are within 150 feet of the project centerline in the case of wells, seeps, and springs. When significant impacts occur, mitigation measures are outlined to reduce the impacts to less than significant levels. Applicant proposed measures (APMs) and agency recommended mitigation measures (MMs) are listed in this section as part of each potential impact analysis.

Readily available public documentation was used to compile this impact analysis. EISs from other projects in the California/Nevada vicinity were reviewed for impact criteria and commonly applied MMs. County plans and BLM Resource Management Plans were assessed for impact thresholds, MMs, and BMPs.

3.8.3.4 Applicant Proposed Measures

The applicant has included the following APMs related to hydrology and water quality:

APM W-1: Avoid Stream Channels. Construction equipment would be kept out of flowing stream channels.

APM W-2: Erosion Control and Hazardous Material Plans. Erosion control and hazardous material plans would be incorporated into the construction bidding specifications to ensure compliance.

APM W-3: Project Design Features. Appropriate design of tower footing foundations, such as raised foundations and/or enclosing flood control dikes, would be used to prevent scour and/or inundation by a 100-year flood. Where floodplain encroachment is required by the CPUC and/or the BLM, and potential impacts require non-standard designs, hydrology/channel flow analysis would be performed.

APM W-4: Avoid Active Drainage Channels. Towers would be located to avoid active drainage channels, especially downstream of steep hillslope areas, to minimize the potential for damage by flash flooding and mud and debris flows.

APM W-5: Diversion Dikes. Diversion dikes would be required to divert runoff around a tower structure or a substation site if (a) the location in an active channel (or channels) could not be avoided; and (b) where there is a very significant flood scour/deposition threat, unless such diversion is specifically exempted by the CPUC and/or the BLM Authorized Officer.

APM W-6: Collect and Divert Runoff. Runoff from roadways would be collected and diverted from steep, disturbed, or otherwise unstable slopes.

APM W-7: Ditch and Drainage Design. Ditches and drainage devices would be designed to handle the concentrated runoff and located to avoid disturbed areas. They would have energy dissipations at discharge points that might include rip-rap, concrete aprons, and stepped spillways. Where diversion dikes are required to protect towers or other project structures from flooding or erosion, these dikes would be designed to avoid increasing the risk of erosion or flooding onto adjacent property.

APM W-8: Minimize Cut and Fill Slopes. Cut and fill slopes would be minimized by a combination of benching and following natural topography where possible.

APM W-9: Prepare and Implement an Approved SWPPP. As a part of the SWPPP, soil disturbance at tower construction sites and access roads would be the minimum necessary for construction and designed to prevent long-term erosion through the following activities: restoration of disturbed soil, re-vegetation, and/or construction of permanent erosion control structures. BMPs in the project SWPPP would be implemented during construction to minimize the risk of an accidental release.

APM W-10: Emergency Release Response Procedures. The Emergency Release Response Procedures developed pursuant to APM HAZ-1 would be maintained onsite (or in vehicles) during construction of the proposed project.

APM W-11: Conduct a Worker Environmental Awareness Program (see BIO-6, CR-2b, PALEO-3). A Worker Environmental Awareness Program (WEAP) would be conducted to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, and proper BMP implementation, to all field personnel prior to the start of construction. This training program would emphasize site-specific physical conditions to improve hazard prevention. It would include a review of all site-specific plans, including but not limited to the project's SWPPP and Hazardous Substances Control and Emergency Response Plan. The applicant would document compliance and maintain a list of names of all construction personnel who had completed the training program.

APM W-12: Properly Dispose of Hazardous Materials. All construction and demolition waste, including trash and litter, garbage, and other solid waste, would be removed and transported to an appropriately permitted disposal facility. Petroleum products and other potentially hazardous materials would be removed and transported to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.

APM W-13: Identify Location of Underground Utilities Prior to Excavation. Prior to excavation, the applicant or its contractors would locate overhead and underground utility lines, such as natural gas, electricity, sewage, telephone, fuel, and water lines, or other underground structures that may reasonably be expected to be encountered during excavation work.

APM W-14: Prepare or Update Spill Prevention, Control, and Countermeasure (SPCC) Plans. The applicant would prepare or update SPCC plans for substations to minimize, avoid, and/or clean up unforeseen spill of hazardous materials during facility operations.

3.8.3.5 Proposed Project / Proposed Action

Construction

The linear components of the proposed project (the Eldorado–Ivanpah transmission line and the telecommunications line) would have very similar construction impacts and are therefore discussed jointly. The transmission line would replace an existing line in approximately the same location.

The potential for increased erosion or siltation on site or off site due to alteration of surface drainage patterns during construction of the proposed project would be minor, localized, and short term. In general, construction activities causing ground disturbance, such as grading, may change natural runoff patterns, thereby affecting natural erosion and siltation processes. Water used for dust suppression during construction could suspend and transport more sediment than is typically moved in the arid climate. In the Ivanpah Valley, sediment load transport to the surface of Ivanpah Dry Lake is part of natural processes. Assessing erosion and siltation impacts includes considering measures for reducing sediment contribution downstream. The applicant has stated that construction equipment would be kept out of flowing stream channels except when absolutely necessary for crossings (APM W-1). Also, transmission towers would be located to avoid active drainage channels (APM W-4). As part of the proposed project construction, the applicant would collect and divert runoff (APM W-6), design ditches and drainages (APM W-7), and minimize cut and fill slopes (APM W-8). All of these measures would help minimize changes to surface drainage patterns and reduce stormwater velocity where changes would occur, therefore preventing excessive erosion and siltation. Proper implementation of MM W-1 (Erosion Control Plan) would require adherence to all BMPs and county plan erosion practices.

The potential for the introduction of hazardous contamination into surface water resources during construction of the proposed project would be minor, localized, and short term. The greatest possibility for hazardous releases would occur at staging areas and refueling stations. As part of construction, the applicant would implement a hazardous materials and waste handling management program (APM HAZ-2) that had emergency release response procedures to address any potential release of hazardous materials (APM W-10), and would properly dispose of hazardous materials (APM W-12). To prevent any potential disturbance to existing utilities and pipelines, the applicant would use a service to identify underground utility lines (APM W-13) before construction began. The applicant would also implement a SWPPP (APM W-9). Other measures the applicant would implement to decrease the potential of contaminating water resources would be to avoid stream channels (APM W-1) and conduct a worker environmental awareness program (APM W-11). For operations at the substations, the applicant would be required by law to implement SPCC plans (APM W-14), which are designed to prevent or minimize spills. The above-described measures would reduce the potential for spills of hazardous materials and outline cleanup measures to be implemented if a spill occurred. Since groundwater in this region is more than 500 feet below the surface, it is highly unlikely that groundwater could become contaminated given the current project design and APMs; therefore, there would be no impacts to groundwater resources. Despite the applicant's measures, however, surface water contamination due to an unanticipated spill of vehicle oil or mud slurry could occur. Due to the minimal amount of surface water and low levels of precipitation in the area, a spill would likely be contained prior to contamination of water resources; therefore, the impact would be minor, short-term, and localized.

The potential for interference with aquifer recharge by the proposed project would be negligible, localized, and short term. In general, increasing the area of impervious surfaces in an area can result in local wells or aquifers receiving fewer groundwater inputs. However, because transmission line construction would replace existing structures, it would not change the existing impervious area. The construction and operation of the new Ivanpah Substation would result in an increase in impervious area. However, this area is small when compared with the amount of non-impervious area in the recharge basins. As part of the construction of the proposed project, the applicant would avoid stream channels (APM W-1), collect and divert runoff (APM W-6), and develop ditch and drainage design (APM W-7). These measures would allow for infiltration of surface water and subsequent groundwater recharge at rates consistent with preconstruction conditions.

Until the source of water to be used has been determined, the potential for lowering the local water table during construction would be minor to moderate, localized, and short term. The applicant stated that water would be used for dust suppression during construction. Depending on the quantity used, this could decrease local groundwater supply and recharge. As part of MM W-2 (Water Use Plan), the applicant would be required to identify quantities and sources of water to be used during each phase of the proposed project in order to identify areas where local groundwater supply and recharge could be adversely affected. To avoid such effects, MM W-2 also sets maximum water use limits for the construction and operation phases of the proposed project.

The potential for increased flooding due to modification of surface drainage patterns during construction of the proposed project would be localized and short term. Ground disturbance associated with project construction could alter natural drainage patterns, causing a change in the hydrologic inputs to a stream, thus affecting the flow volume and route. As part of the proposed construction process, the applicant would keep equipment out of stream channels (APM W-1), assess contractor erosion control plans during the bidding process (APM W-2), and avoid placement of transmission poles within active drainage channels (APM W-4). These measures would reduce temporary impacts to flowing steams and permanent impacts to existing drainage channels.

However, these measures do not address construction impacts to existing drainage channels. MM W-3 (On-Site Flow Model) requires the applicant to predict any alteration in flow paths as a result of construction of the proposed project and establish a channel system to mitigate any impacts associated with altered flow paths. Since the project would be located on an active alluvial fan where channels and dry washes are integral to site drainage, preservation of these features is an important mitigation measure. Construction across the Ivanpah Dry Lake would result in disturbance to the playa surface and normal flooding processes. MM W-4 (Restoration of Dry Lake) would restore the lake surface to preconstruction conditions.

Flooding or inundation on alluvial fans due to random storm events during construction of the Eldorado–Ivanpah Transmission Line—or flooding or inundation by mudflow due to modified runoff patterns during construction of the Ivanpah Substation or telecommunications line—would be unlikely, but due to its potential severity, could be significant if it did occur. Because alluvial material is loose, the sediments of alluvial fans can move and shift, particularly during heavy precipitation events such as flash floods. Within an alluvial fan, there are usually established drainage patterns for normal precipitation events. However, if a flash flood event occurred at the proposed project site and the natural drainages were overtopped, there would be sheet flow over some or most of the proposed site. As part of construction, the applicant would keep equipment out of flowing streams (APM W-1), avoid tower placement in active drainage channels (APM W-4), create a system of diversion dikes around any sites where active channels could not be avoided (APM W-5), collect and divert runoff from roadways (APM W-6), develop ditches and drainage devices to reduce stormwater speed (APM W-7), and, as required by law, implement a SWPPP (APM W-9). Even with these measures, construction activities could change natural runoff patterns, thereby affecting waterbody volume and flow, possibly affecting flooding patterns of local waterways.

The proposed project area is in a region known for active alluvial fans, which are vulnerable to flooding and debris flows in times of heavy rain. Small, unmapped drainages in the active portions of alluvial fans are essential to effective drainage. As a part of MM W-5 (Hydrological Model of Alluvial Fan), the applicant will analyze all alluvial fans in the project area to determine the most active sections. Following this analysis, project components would be sited on the least active areas of the fans to reduce the possibility of floods or debris flows.

Transmission line tower footings would be constructed within a 100-year flood hazard area through the Ivanpah Dry Lake, as shown in Figure 3.8.2. Additionally, the telecommunications line would cross through a 100-year flood hazard zone near Nipton Road. The Ivanpah Substation would not be located in a 100-year flood hazard zone. Due to the relatively flat topography of the flood hazard areas, project facilities are unlikely to impede any flood waters, and the risk associated with this hazard would be localized and short term. If flood waters were to pool during extreme precipitation events, they would likely accumulate slowly, allowing ample time for the construction staff to vacate the area. During construction, the applicant would design all tower footings to withstand scour and withstand inundation from a 100-year flood (APM W-3) so that flooding at tower footings would not pose a risk to the public.

The potential for increased risk of loss, injury, or death due to flooding or dam failure during construction of the proposed project would be limited. Flooding could cover an extensive area and would be short term. There are no dams in the area, so there is no impact associated with flooding due to dam failure. As discussed above, the proposed project area is known for active alluvial fans, which are vulnerable to flooding and debris flows in times of heavy rain. Alluvial fan debris flows can carry sediments, cobbles, and even large objects such as trees, cars, and small buildings, thus presenting a threat to surrounding people and property. If project facilities were in the path of flood flows, there would be a slight possibility the facilities could be picked up and carried with the debris flow, presenting a threat to the construction crews, surrounding environment, and local communities.

However, it is unlikely that construction equipment would actually impede or redirect a flood flow. As part of construction of the proposed project, the applicant would keep construction equipment out of flowing streams (APM W-1), avoid tower placement in active drainage channels (APM W-4), create a system of diversion dikes around any sites where active channels could not be avoided (APM W-5), and develop ditches and drainage devices to reduce stormwater speed (APM W-7). These measures would ensure that active drainage channels were not hindered by construction activity. As mentioned above, small, unmapped drainages in active portions of alluvial fans are essential to effective drainage during extreme precipitation events and flash floods. As a part of MM W-5 (Hydrological Model of Alluvial Fan), the applicant would analyze the fans in the project area to determine the most active sections. Following this analysis, the project facilities would be sited on the least active lobes of the alluvial fans to mitigate against floods or debris flows and their inherent threat to life and property.

Operation and Maintenance

Eldorado–Ivanpah Transmission Line

The operation and maintenance impacts for the proposed project would be similar to the construction impacts. Surface water contamination due to an unanticipated spill of vehicle oil during routine inspection, repair, and washing of the line would be possible. Due to the minimal amount of surface water, low levels of precipitation in the area, and implementation of the applicant's operation policies, spills would likely be contained prior to contamination of water resources. Routine washing of the line would require use of local groundwater resources. These surface changes could shift subsurface hydrology in such a way that local wells or aquifers might not receive groundwater inputs at the same rate as they did before construction, resulting in an overall change in local groundwater supply and recharge. Flooding or inundation by mudflow due to modified runoff patterns would be possible. However, the proposed project's impacts would likely be similar to those of the existing transmission line that currently operates and undergoes routine maintenance. Therefore, operation and maintenance activities associated with the transmission line would not result in any additional impacts to water resources.

Ivanpah Substation

The Ivanpah Substation would be constructed within the limits of the proposed ISEGS project. Therefore, the applicant would integrate the Ivanpah Substation surface water management into the BrightSource LLC Surface Water Management Plan, approved by the California Energy Commission (CEC) in the FSA/DEIS for the ISEGS project. The applicant for the ISEGS project, (BrightSource LLC) conducted an onsite investigation of the hydrology of the ISEGS site (including the Ivanpah Substation site) and computer modeling of storm flows and sedimentation rates. The ISEGS project would adopt a low impact development design for grading related to stormwater flow. The low impact development design would maintain natural drainage patterns to the extent practicable. All stormwater flow would be consistent with the guidance developed by San Bernardino County.

As a new structure, the Ivanpah Substation would result in additional impacts to water resources during operation and maintenance relative to preconstruction conditions. As described above, the Ivanpah Substation would be fenced and co-located in the construction logistics area for the ISGES project. The ISEGS project would use low-impact development design and maintain existing drainage to the extent practicable. However, there would be impacts associated with alteration of surface drainage patterns at the Ivanpah Substation and hazards associated with flooding. These impacts are described below. The CEC is the lead agency for the ISEGS project. To ensure protection of water quality during construction and operation of the ISEGS project, the CEC is requiring ISEGS to prepare and submit a Drainage, Erosion, and Sedimentation Control Plan (DESCP) and to prepare a SWPPP. As part of MM W-6, EITP will be required to submit copies of the approved DESCP and SWPPP to CPUC three months prior to the start of construction.

As discussed above in the construction section, alteration of the course of a stream due to modification of surface drainage patterns during construction of the Ivanpah Substation could result in localized erosion and downstream flooding. If these impacts were to occur during construction and were not appropriately addressed, they would be minor, localized, and long term throughout the operation and maintenance of the Ivanpah Substation.

NEPA Summary

With respect to hydrology, construction of the proposed project would result in impacts ranging from minor to moderate. Impacts would generally be local in extent. The applicant would take precautions to prevent erosion and sedimentation during construction and operation, including avoiding active stream and drainage channels (APMs W-1, W-4), providing erosion plans as part of the contractor bidding process (APM W-2), designing tower footings to prevent scour (APM W-3), requiring design measures to collect and divert runoff to prevent excessive erosion (APMs W-5, W-6, W-7, W-8), and, as required by law, developing and implementing a SWPPP. However, special consideration needs to be taken because the proposed project would be sited on active alluvial fans. Implementation of MM W-1 would ensure that all local and regional erosion control plans and water quality permits would be adhered to. MM W-3 would require the applicant to model any changes in flow paths that would occur as a result of construction of the proposed project and mitigate any effects with a channel system. MM W-6 would ensure that appropriate erosion control measures are implemented at the Ivanpah Substation. Implementation of these MMs would reduce any impacts due to erosion and sedimentation to minor, localized levels.

The potential for the introduction of hazardous contamination into surface water resources during construction of the proposed project would be minor, localized, and short term. During construction, the applicant would implement a hazardous materials and waste handling management program (APM HAZ-2) that would have emergency release response procedures to address any potential release of hazardous materials (APM W-10), and would properly dispose of hazardous materials (APM W-12). To prevent any potential disturbance to existing utilities and pipelines, the applicant would use a service to identify underground utility lines (APM W-13) before construction began. The applicant would also implement a SWPPP (APM W-9). To further decrease the potential to contaminate water resources, they would avoid stream channels (APM W-1) and conduct a worker environmental awareness program (APM W-11). For operations at the substations, they would implement SPCC plans (APM W-14), which are designed to prevent or minimize spills. With the successful execution of the APMs listed above, construction of the proposed project would not result in short- or long-term violations of federal or state water quality standards.

Construction projects have the potential to alter the flow or degrade the quality of groundwater to natural systems or wells for private or municipal use. Because the depth to groundwater at the proposed project site is more than 500 feet, there would be no impacts to groundwater quality due to construction and operation of the proposed project. The proposed project would use water for dust suppression during construction. During the operation phase, water would be used at the substation for sanitary purposes and fire control during emergencies. The applicant has stated that no wells would be drilled for the proposed project's water supply. As part of MM W-2 (Water Use Plan), the applicant would be required to identify the quantity and sources for all water to be used during construction and operation. MM W-2 also sets maximum water use limits for the construction and operation phases of the proposed project. Despite implementation of these measures, impacts to groundwater would be minor to moderate and localized, until the water source is known.

Impacts during operation and maintenance would be similar to those of current operations of the existing transmission line.

CEQA Significance Determinations

IMPACT HYDRO-1: Introduction of Hazardous Contamination into Surface and Groundwater
Less than significant with mitigation

Although the proposed project could pose a potential adverse impact on surface and groundwater resources due to hazardous contamination during construction and operation and maintenance of the lines and substation, the applicant would undertake multiple measures to minimize this potential. As discussed above, the applicant would implement a hazardous materials and waste handling management program (APM HAZ-2) that would outline proper handling, storage, and disposal of hazardous materials as well as detail how to address any potential release. The applicant would also undertake measures to avoid operating in stream channels (APM W-1) and implement a SWPPP (APM W-9). For operations, they would implement an SPCC plan at their substations. These measures would reduce the potential for spills of hazardous materials and outline cleanup measures to be implemented should a spill occur.

In addition, the hydrology of the area would prevent any spill that occurred from migrating quickly or far. Because precipitation levels are low and groundwater in this region is located more than 500 feet below the surface, it is highly unlikely that any release would migrate to groundwater. In addition, there are few permanent surface waters, so there are few that could be adversely affected. However, an unanticipated spill of vehicle oil or mud slurry could occur. With proper implementation of MM W-1 (Erosion Control Plan and Compliance with Water Quality Permits) and MM W-6 (DESCP and SWPPP for Ivanpah Substation), the potential impact on surface water quality from erosion would be reduced to less than significant levels.

IMPACT HYDRO-2: Lowering of Water Table or Interference with Aquifer Recharge
Potentially significant

The proposed project could have impacts on the local water table and on aquifer recharge processes by altering surface water drainages and exceeding current groundwater withdrawal conditions. Construction activities could shift subsurface hydrology in such a way that local wells or aquifers might not receive groundwater inputs at the same rate as prior to construction. Increased impermeable surfaces could limit surface water absorption processes. The altered runoff patterns could decrease local groundwater supply and recharge and deplete water available for surface waterbodies. Since transmission line construction would replace existing structures, construction would not change the existing impervious area. The construction and operation of the new Ivanpah Substation would result in an increase in impervious area, but this area would be relatively small relative to the surrounding pervious area, which could receive the surface water runoff.

During construction, the applicant would avoid stream channels (APM W-1), collect and divert runoff (APM W-6), and develop ditch and drainage design (APM W-7). These measures would allow for infiltration of surface water and subsequent groundwater recharge at rates consistent with preconstruction conditions.

The applicant stated that water would be used for dust suppression during construction. Depending on the quantity and sources to be used, this could decrease local groundwater supply and recharge. As part of MM W-2 (Water Use Plan), the applicant would identify quantities and sources of water to be used during each phase of the proposed project. MM W-2 also sets maximum water use limits for the construction and operation phases. However, because the source of the water to be used during construction is currently unknown, at this point the possibility that the impact on groundwater supplies could be significant must be considered.

IMPACT HYDRO-3: Increased Erosion or Siltation due to Alteration of Surface Drainage Patterns
Less than significant with mitigation

There would be potential for increased erosion or siltation on site or off site due to project construction and operation and maintenance activities. Construction activities causing ground disturbance, such as grading, may change natural runoff patterns, thereby affecting natural erosion and siltation processes. Water used for dust suppression during construction could suspend and transport more sediment than is typically moved in the arid climate. In the Ivanpah Valley, sediment load transport to the surface of Ivanpah Dry Lake is part of natural processes. Assessment of impacts due to erosion and siltation includes analysis for reducing sediment contribution downstream. The applicant has stated that construction equipment would be kept out of flowing stream channels except when absolutely necessary for crossings (APM W-1). Also, transmission towers would be located to avoid active drainage channels (APM W-4). As part of the proposed project construction, the applicant would collect and divert runoff (APM W-6), develop ditch and drainage design (APM W-7), and minimize cut and fill slopes (APM W-8). All these measures would help minimize changes to surface drainage patterns and reduce stormwater velocity where changes would occur, therefore preventing excessive erosion and siltation. Because MM W-1 (Erosion Control Plan) and MM W-6 (DESCP and SWPPP for Ivanpah Substation) would ensure that all BMPs and county plan erosion practices are adhered to, erosion and siltation levels would be kept consistent with preconstruction conditions, thereby reducing this impact to less than significant levels.

IMPACT HYDRO-4: Altered Course of Stream or River due to Modification of Surface Drainage Patterns
Less than significant with mitigation

The proposed project could cause alteration of the course of a stream due to modification of surface drainage patterns. Construction activities causing ground disturbance and alteration of natural drainage patterns could cause a change in the hydrologic inputs to a stream, thus affecting the flow volume or route. Changes to surface contours could be permanent and could affect the stream flow over the long term. As part of the proposed construction process, the applicant would keep equipment out of stream channels (APM W-1), consider erosion control plans during the bidding process (APM W-2), and avoid placement of transmission poles within active drainage channels (APM W-4). These measures would reduce temporary impacts to flowing steams and permanent impacts to existing drainage channels.

However, these measures do not address construction impacts to existing drainage channels. MM W-3 (On-Site Flow Model) requires the applicant to predict any alteration in flow paths as a result of construction of the proposed project and establish a channel system to mitigate any impacts associated with altered flow paths. Since the project would be located on an active alluvial fan where channels and dry washes are integral to site drainage, preservation of these features is an important mitigation measure. Construction across the Ivanpah Dry Lake would result in disturbance to the playa surface and normal flooding processes. MM W-4 (Restoration of Dry Lake) requires the applicant to restore the lake surface to preconstruction conditions, therefore reducing this impact to less than significant levels.

IMPACT HYDRO-5: Modified Runoff Characteristics, Possibly Leading to Flooding or Inundation by Mudflow
Less than significant with mitigation

The proposed project would be unlikely to cause flooding or inundation by mudflow, but due to the severity of potential impact from these events, the impact from flooding or inundation is potentially significant. Construction activities causing ground disturbance could change natural runoff patterns, thereby affecting volume and flow of surface and subsurface waters and possibly affecting flooding patterns of local waterways. The proposed project area is in a region known for active alluvial fans, which are vulnerable to flooding and debris flows in times of heavy rain. Because alluvial material is loose, the sediments of alluvial fans can move and shift, particularly during heavy precipitation events such as flash floods. Within an alluvial fan, there are usually established drainage patterns for normal precipitation events. However, if a flash flood event occurred at the proposed project site and the natural drainages were overtopped, there would be sheet flow over some or most of the proposed site.

As part of construction of the proposed project, the applicant would keep construction equipment out of flowing streams (APM W-1), avoid tower placement in active drainage channels (APM W-4), create a system of diversion dikes around any sites where active channels could not be avoided (APM W-5), collect and divert runoff from roadways (APM W-6), develop ditches and drainage devices to reduce stormwater speed (APM W-7), and, as required by law, implement a SWPPP (APM W-9). Even with these measures, construction activities could change natural runoff patterns, thereby affecting waterbody volume and flow, possibly affecting flooding patterns of local waterways. As mentioned, active alluvial fans are vulnerable to flooding and debris flows in times of heavy rain. Small, unmapped drainages in the active portions of alluvial fans are essential to effective drainage. As a part of MM W-5 (Hydrological Model of Alluvial Fan), the applicant would analyze all alluvial fans in the project area to determine the most active sections. Following this analysis, proposed project components would be sited on the least active areas of the fans to reduce the possibility of floods or debris flows, therefore reducing this impact to less than significant levels.

IMPACT HYDRO-6: Substantially Degrade Water Quality
Less than significant with mitigation

The proposed project could degrade water quality by increasing erosion or sedimentation in surface waters or through the introduction of hazardous materials into surface waters. Potential impacts from the introduction of hazardous materials would be less than significant without mitigation. Implementation of MMs W-1, W-3, and W-6 would reduce potential impacts due to erosion and sedimentation to less than significant levels.

IMPACT HYDRO-7: Placement of Structures within a 100-year Flood Hazard Area
Less than significant without mitigation

Transmission line tower footings would be constructed within a 100-year flood hazard area through the Ivanpah Dry Lake, as shown in Figure 3.8.2. Additionally, the telecommunications line would cross through a 100-year flood hazard zone near Nipton Road. Although the Ivanpah Substation would be located within a FEMA Zone D, which is classified as areas with possible flood hazards, this facility would not be located in a 100-year flood hazard zone... Due to the relatively flat topography of the flood hazard areas, the risk associated with this hazard would be minor. If flood waters were to pool during extreme precipitation events, they would likely accumulate slowly, allowing ample time for the construction staff to vacate the area. The applicant would design tower footings to withstand scour and inundation from a 100-year flood (APM W-3). This measure would ensure that flooding at tower footings would not pose a safety risk. This impact would be less than significant without mitigation.

IMPACT HYDRO-8: Exposure to a Significant Risk of Flooding
Less than significant with mitigation

The proposed project has limited potential to expose people or structures to a significant risk of loss, injury, or death due to flooding. There are no dams in the area, so there is no impact associated with dam failure. However, the project area is in a region with active alluvial fans, which are vulnerable to flooding and debris flows in times of heavy rain. Alluvial fan debris flows can carry sediments, cobbles, and even large objects such as trees, cars, and small buildings, thus presenting a threat to surrounding people and property. If project facilities were in the path of flood flows, there would be a slight possibility the facilities could be picked up and carried with the debris flow, presenting a threat to the construction crews, surrounding environment, and local communities. However, it is unlikely that project facilities or construction equipment would actually impede or redirect a flood flow.

As part of construction of the proposed project, the applicant would keep construction equipment out of flowing streams (APM W-1), avoid tower placement in active drainage channels (APM W-4), create a system of diversion dikes around any sites where active channels could not be avoided (APM W-5), and develop ditches and drainage devices to reduce stormwater speed (APM W-7). These measures would ensure that active drainage channels were not hindered by construction activity. As mentioned above, small, unmapped drainages in active portions of alluvial fans are essential to effective drainage during extreme precipitation events and flash floods. As a part of MM W-5 (Hydrological Model of Alluvial Fan), the applicant would analyze the fans in the project area to determine the most active sections. Following this analysis, the project facilities would be sited on the least active lobes of the alluvial fans to mitigate against floods or debris flows and their inherent threat to life and property. With proper implementation of MM W-5, there would be a less than significant risk of loss, injury, or death due to flooding.

IMPACT HYDRO-9: Modify Runoff Characteristics, Possibly Leading to Flooding or Inundation by Mudflow
Less than significant with mitigation

Mudflow risks are very similar to the flooding risks described in IMPACT HYDRO-7. It is possible that construction activities or final structures would be placed such that they would impede or redirect mudflows. The proposed project area is located in a region known for active alluvial fans, which are vulnerable to flooding and debris flows in times of heavy rain. However, it is unlikely that project facilities or construction equipment would actually impede or redirect a flood flow. The applicant would keep construction equipment out of flowing streams (APM W-1), avoid tower placement in active drainage channels (APM W-4), create a system of diversion dikes around any sites where active channels could not be avoided (APM W-5), and develop ditches and drainage devices to reduce stormwater speed (APM W-7). These measures would ensure that active drainage channels were not hindered by construction activity. As mentioned above, small, unmapped drainages in active portions of alluvial fans are essential to effective drainage during extreme precipitation events and flash floods. As part of MM W-5 (Hydrological Model of Alluvial Fan), the applicant would analyze the fans in the project area to determine the most active sections. Following this analysis, the project facilities would be sited on the least active lobes of the alluvial fans to mitigate against floods or debris flows and their inherent threat to life and property. With proper implementation of MM W-5, there would be a less than significant risk of loss, injury, or death due to mudflow.

3.8.3.6 No Project / No Action Alternative

Under the No Project Alternative, the proposed action would not be implemented. Therefore, the No Project Alternative would have no impact on existing water resources in the proposed project area.

3.8.3.7 Transmission Alternative Route A

Transmission Line Alternative A is similar to the proposed project in that it is located in areas of similar water resources and topography. All impacts would be direct and adverse. Minor, localized, short-term impacts related to this alternate route would include those associated with surface and groundwater contamination. Minor to moderate extensive, long-term impacts related to this alternate route would include those associated with lowering of the local water table due to water use during construction and routine washing of the lines and redirection or modification of flood flows by construction equipment or tower footings. With the implementation of APMs W-1 through W-14 and MMs W-1 through W-5, less than significant impacts related to this alternate route would include those associated with the alteration of surface drainage patterns, and increased erosion and siltation due to the alteration of drainage patterns, water quality, and flooding.

3.8.3.8 Transmission Alternative Route B

Transmission Line Alternative B is similar to the proposed project in that it is located in areas of similar water resources and topography. All impacts would be direct and adverse. Minor, localized, short-term impacts related to this alternate route would include those associated with surface and groundwater contamination. Minor to moderate extensive, long-term impacts related to this alternate route would include those associated with lowering of the local water table due to water use during construction and routine washing of the lines and redirection or modification of flood flows by construction equipment or tower footings. With the implementation of APMs W-1 through W-14 and MMs W-1 through W-5, less than significant impacts related to this alternate route would include those associated with the alteration of surface drainage patterns, and increased erosion and siltation due to the alteration of drainage patterns, water quality, and flooding.

3.8.3.9 Transmission Alternative Route C

Transmission Line Alternative C is similar to the proposed project in that it is located in areas of similar water resources and topography. All impacts would be direct and adverse. Minor, localized, short-term impacts related to this alternate route would include those associated with surface and groundwater contamination. Minor to moderate extensive, long-term impacts related to this alternate route would include those associated with lowering of the local water table due to water use during construction and routine washing of the lines and redirection or modification of flood flows by construction equipment or tower footings. With the implementation of APMs W-1 through W-14 and MMs W-1 through W-5, less than significant impacts related to this alternate route would include those associated with the alteration of surface drainage patterns, and increased erosion and siltation due to the alteration of drainage patterns, water quality, and flooding.

3.8.3.10 Transmission Alternative Route D and Subalternative E

Transmission Line Alternative D and Subalternative E are similar to the proposed project in that they are located in areas of similar water resources and topography. All impacts would be direct and adverse. Minor, localized, short-term impacts related to this alternate route would include those associated with surface and groundwater contamination. Minor to moderate extensive, long-term impacts related to this alternate route would include those associated with lowering of the local water table due to water use during construction and routine washing of the lines and redirection or modification of flood flows by construction equipment or tower footings. With the implementation of APMs W-1 through W-14 and MMs W-1 through W-5, less than significant impacts related to this alternate route would include those associated with the alteration of surface drainage patterns, and increased erosion and siltation due to the alteration of drainage patterns, water quality, and flooding.

These alternatives are co-located with an existing transmission line through Ivanpah Dry Lake and, therefore, would not additionally contribute to the disturbance of surface drainage patterns on the dry lake bed.

3.8.3.11 Telecommunication Alternative (Golf Course)

The Golf Course Telecommunication Alternative is similar to the proposed project in that it is located in areas with similar water resources and topography. All impacts would be direct and adverse. Minor, localized, short-term impacts related to this alternate route would include those associated with surface and groundwater contamination. Minor to moderate extensive, long-term impacts related to this alternate route would include those associated with lowering of the local water table due to water use during construction and routine washing of the lines and redirection or modification of flood flows by construction equipment or tower footings. With the implementation of APMs W-1 through W-14 and MMs W-1 through W-5, less than significant impacts related to this alternate route would include those associated with the alteration of surface drainage patterns, and increased erosion and siltation due to the alteration of drainage patterns, water quality, and flooding. The Golf Course Telecommunication Alternative avoids Ivanpah Dry Lake; therefore, surface drainage patterns on the dry lake bed would not be disturbed.

3.8.3.12 Telecommunication Alternative (Mountain Pass)

The Mountain Pass Telecommunication Alternative is similar to the proposed project in that they are located in the same vicinity and would have similar impact on water resources. This alternative extends into the foothills of the Clark Mountain Range, while the proposed project route crosses the Ivanpah Valley. All impacts of the Mountain

Pass Telecommunication Alternative would be direct and adverse. Minor, localized, short-term impacts related to this alternate route would include those associated with surface and groundwater contamination. Minor to moderate extensive, long-term impacts related to this alternate route would include those associated with lowering of the local water table due to water use during construction and routine washing of the lines and redirection or modification of flood flows by construction equipment or tower footings. With the implementation of APMs W-1 through W-14 and MMs W-1 through W-5, less than significant impacts related to this alternate route would include those associated with the alteration of surface drainage patterns and increased erosion and siltation due to alteration of drainage patterns, water quality, and flooding.

3.8.4 Mitigation Measures

MM W-1: Erosion Control Plan and Compliance with Water Quality Permits. The applicant will employ a professional engineer to develop and implement an Erosion Control Plan and monitor construction activities to ensure compliance with federal and state water quality permits. The Erosion Control Plan will comply with or exceed BMPs commonly used on projects in the California/Nevada area and those outlined in county plans. Copies of the Erosion Control Plan will be submitted to CPUC. The intent of this MM is to minimize the impact of construction on surface water quality in the basins surrounding the proposed project. This MM will apply to all construction sites for the duration of construction and restoration activities.

MM W-2: Water Use Plan. The applicant will develop a Water Use Plan that specifies the quantities and sources for all water to be used during construction, operation, and maintenance of the proposed project. The applicant has indicated that water will be used for dust suppression during construction and for toilet flushes and drinking water at the substation. In the applicant's response to Data Request 10.05, they stated that the daily volume of water needed for dust suppression during construction is unknown because there are numerous variables involved. They estimate that between 30.6 and 38.3 acre feet per annum would be needed for the construction phase of the transmission line. The Water Use Plan will identify the approximate quantity of water to be used for each activity, broken down by phase of the project. The applicant has indicated that water would be supplied by a local vendor or agency. The plan will indicate the water sources to be used for each project phase. For each source, the plan will address the potential impact on the local aquifer. Furthermore, as part of MM W-2, the applicant would limit construction phase water use to a maximum of 45 acre feet per annum and operation phase water use to a maximum of 2.5 acre feet per annum. Emergency water uses, including fire suppression, are excluded from these maxima. To the extent feasible, the applicant will use reclaimed water for dust suppression. The Water Use Plan will be submitted to CPUC for review at least three months prior to the start of construction.

MM W-3: Onsite Flow Model and Channel System. The applicant will employ a hydrologist to develop an Onsite Flow Model to predict any alteration in flow path that would result from construction and operation and maintenance of the proposed project. The applicant will also develop a channel system to prevent erosion and to mitigate altered flow paths. The Onsite Flow Model and channel system design will be submitted to the CPUC for review at least three months prior to the start of construction. The intent of this MM is to ensure that stormwater runoff will not cause flooding. The applicant will monitor the channel system throughout construction to assess effectiveness and ensure compliance with the designed system. Additionally, the applicant will coordinate with BLM and CPUC on model parameters and assumptions used in modeling.

MM W-4: Dry Lake Restoration Plan. The applicant will employ a hydrologist and a restoration specialist to develop a Restoration Plan for disturbance of dry lake beds. The proposed project would cross through Ivanpah Lake. Construction would disturb the flat dry lake bed surface that is used for recreation. The intent of this MM is to ensure that the dry lake bed is restored to preconstruction conditions. The BLM will review the plan prior to the start of construction. The BLM would also assess the success of the restoration and determine whether the Ivanpah Lake surface had been restored to preconstruction conditions. The applicant will provide the CPUC with a copy of the Restoration Plan.

MM W-5: Historical Hydrological Model of Alluvial Fan. In the PEA, the applicant completed a historical hydrological model on site area alluvial fan(s) based on similar work on alluvial fans performed near Laughlin, Nevada (House 2005). The applicant extrapolated the data by applying the methodology from the Laughlin area model to the California portion of the project area. This study will be used to determine the active and inactive portions of the alluvial fans in the site area relative to surface water, sediment transport, and flash flooding. Where feasible, the applicant will locate towers, substations, and other permanent site features on inactive portions of the alluvial fan to minimize risk associated with flash flooding and alluvial fan failure.

MM W-6: DESCP, SWPPP, and Grading and Storm Water Management Plan for Ivanpah Substation. The CEC is the lead agency for the ISEGS project. In order to ensure protection of water quality during construction and operation of the ISEGS project, the CEC is requiring ISEGS to prepare and submit a Drainage, Erosion, and Sedimentation Control Plan (DESCP) and to prepare a SWPPP. As part of MM W-6, the applicant will be required to submit copies of the approved DESCP and SWPPP to CPUC three months prior to the start of construction, and implement those plans as part of the EITP.

3.8.5 Whole of the Action / Cumulative Action

Below is a brief summary of information related to hydrology and water quality in the ISEGS FSA/DEIS prepared by the CEC and the BLM. This section focuses on differences in the ISEGS setting and methodology discussed above for the EITP. This section also discloses any additional impacts or mitigation imposed by the CEC for ISEGS.

3.8.5.1 ISEGS Setting

Surface Water Resources and Flooding

The ISEGS project would be developed on an alluvial fan at the base of the Clark Mountain Range. Conditions in the Clark Mountain Range are similar to those described in Section 3.8.1.1, “Surface Water Resources and Flooding.” During field surveys conducted by Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners IV, LLC; and Solar Partners VIII, LLC (Solar Partners, or the applicant), 1,973 ephemeral washes were mapped within the ISEGS project area. The amount and size of washes increases moving topographically up the alluvial fan from the southeast to the northwest. This indicates that the greatest amount of stormwater travels at the fastest speeds in the Ivanpah 3 area. Based on wetland and stream delineations conducted by the applicant in 2008, the USACE determined that ephemeral washes on the alluvial fan are not under USACE’s jurisdiction under Section 404 of the Clean Water Act.

Groundwater Resources

The ISEGS project would be constructed within the Ivanpah Valley Groundwater Basin, described in Section 3.8.1.2, “Groundwater Resources.” Seeps and springs are located upgradient in the Clark Mountains. These features are ephemeral (fed only by precipitation).

The Molycorp Mine, a lanthanide mining and milling operation, discharged contaminated wastewater through a pipeline to evaporation ponds on the Ivanpah Dry Lake between 1980 and 1998. An agreement with the RWQCB requires cleanup and abatement of a groundwater plume that developed below the new evaporation pond, which was in operation between 1988 and 1998.

Applicable Laws, Regulations, and Standards

Due to the variation in project components and location between EITP and ISEGS, different laws, regulations, and standards would apply to ISEGS than those listed for the EITP in Section 3.8.2, “Applicable Laws, Regulations, and Standards.” Regulations affecting ISEGS are summarized in Table 3.8-2. Since ISEGS would be developed entirely within California on BLM land, the Nevada regulations associated with the EITP would not apply. However, the ISEGS project components and operational features trigger laws, regulations, and standards beyond those required for EITP; these additional components are:

- A power plant that requires process cooling water
- Use of recycled power plant process water for mirror washing
- Groundwater wells that may be used for drinking water
- A septic tank / leach field system for sanitary wastewater
- Hydrostatic testing of the natural gas pipeline and discharge of that water
- Grading of large areas of land

Table 3.8-2 Laws, Regulations, and Standards Applicable to the ISEGS Project

Law, Regulation, or Standard	Description	Project Component
Federal		
RCRA, 40 CFR Part 260 et seq.	A comprehensive body of regulations that give U.S. EPA the authority to control hazardous waste "cradle-to-grave." RCRA covers the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also sets forth a framework for management of non-hazardous solid wastes.	Natural gas pipeline
State		
California Constitution, Article X, Section 2	Requires that the water resources of the state be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use, or unreasonable method of use of water is prohibited.	Power plant process water, mirror washing, groundwater wells
California Water Code Section 13050	Defines "waters of the state."	Power plant process water, mirror washing, ground water wells
California Water Code Sections 13240, 13241, 13242, & 13243, & Water Quality Control Plan for the Lahontan Region (Basin Plan)	The Basin Plan establishes water quality objectives that protect the beneficial uses of surface water and groundwater in the region. The Basin Plan describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies and provide comprehensive water quality planning.	Power plant process water, mirror washing, ground water wells
SWRCB 2003-003-DWQ	This general permit applies to the discharge of water to land that has a low threat to water quality.	Hydrostatic test water, recycled process plant water for mirror washing
California Code of Regulations, Title 22, Division 4, Chapter 15	This chapter specifies Primary and Secondary Drinking Water Standards that set MCLs in terms of TDS, heavy metals, and chemical compounds.	Potable water from new wells
California Code of Regulations, Title 23, Division 3, Chapter 15	This chapter applies to waste discharges to land and requires the Regional Board to issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.	Hydrostatic test water, recycled process plant water for mirror washing
CEC IEPR; (Public Resources Code, Div. 15, Section 25300 et seq.)	In the 2003 IEPR, the CEC adopted a policy stating it will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound."	Power plant process water
SWRCB Res. No. 68-16	The "Antidegradation Policy" requires that (1) existing high quality waters of	Power plant

Table 3.8-2 Laws, Regulations, and Standards Applicable to the ISEGS Project

Law, Regulation, or Standard	Description	Project Component
	the state be maintained until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial uses, and will not result in wastewater quality that is lower than that required by other adopted policies and (2) any activity that produces or may produce a waste or increased volume or concentration of waste, and that discharges or proposes to discharge to existing high quality waters, must meet WDRs that will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the state will be maintained.	process water, mirror washing, wells
SWRCB Res. 75-58	The Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling states that fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound.	Power plant process water
SWRCB Res. No. 88-63	States that all groundwater and surface water of the state are considered suitable for municipal or domestic water supply with the exception of those waters that meet specified conditions.	Power plant process water, mirror washing, wells
SWRCB Res. 2005-0006	Adopts the concept of sustainability as a core value for SWRCB programs and directs its incorporation in all future policies, guidelines, and regulatory actions.	Power plant process water, mirror washing, wells
SWRCB Res. 2008-0030	Requires sustainable water resources management such as low impact development and climate change considerations in all future policies, guidelines, and regulatory actions. Directs RWQCBs to "aggressively promote measures such as recycled water, conservation, and low impact development Best Management Practices where appropriate and work with Dischargers to ensure proposed compliance documents include appropriate, sustainable water management strategies."	Power plant process water, mirror washing
The California Safe Drinking Water and Toxic Enforcement Act	The California Health & Safety Code Section 25249.5 et seq. prohibits actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity. The RWQCB administers the requirements of the act.	Hydrostatic test water, recycled process plant water for mirror washing
Local		
California Safe Drinking Water Act and San Bernardino County Code Title 3, Division 3, Chapter 6, Public Water Supply Systems	Require public water systems to obtain a Domestic Water Supply Permit. Public water systems are defined as systems providing water for human consumption through pipes or other constructed conveyances that have 15 or more service connections or regularly serve at least 25 individuals daily at least 60 days per year. CDPH administers the Domestic Water Supply Permit program and has delegated issuance of Domestic Water Supply Permits for smaller public water systems in San Bernardino County to the county. Under the San Bernardino County Code, the County Department of Environmental Services monitors and enforces all applicable laws and orders for public water systems with less than 200 service connections. The proposed project would likely be considered a non-transient, non-community water system.	Potable water from new wells
San Bernardino County Title 3, Division 3, Chapter 6, Article 5, Desert Groundwater Management	This article helps the county protect water resources in unregulated portions of the desert, while not precluding use of water resources. This article requires a permit to locate, construct, operate, or maintain a new groundwater well within the unincorporated, unadjudicated desert region of	New wells

Table 3.8-2 Laws, Regulations, and Standards Applicable to the ISEGS Project

Law, Regulation, or Standard	Description	Project Component
	San Bernardino County. CEQA compliance must be completed prior to issuance of a permit, and groundwater management, mitigation, and monitoring may be required as a condition of the permit. The ordinance states that it does not apply to "groundwater wells located on Federal lands unless otherwise specified by interagency agreement." The BLM and county entered into an MOU that provides that the BLM will require conformance with this code for all projects proposing to use groundwater from beneath public lands.	
San Bernardino County Ordinance Code, Title 3, Division 3, Chapter 8, Waste Management, Article 5, Liquid Waste Disposal	Requires the following compliance for all liquid waste disposal systems: (1) compliance with applicable portions of the Uniform Plumbing Code and the San Bernardino County DEHS standards; (2) approval by the DEHS and building authority with jurisdiction over the system; or (3) for alternative systems, approval by the DEHS, the appropriate building official of this jurisdiction, and the appropriate California RWQCB.	Power plant process water, new septic tank and leach field
San Bernardino County Ordinance Code, Title 6, Division 3, Chapter 3, Uniform Plumbing Code	Describes the installation and inspection requirements for locating disposal/leach fields and seepage pits.	New septic tank and leach field

Key:
BLM = Bureau of Land Management
CDPH = California Department of Public Health
CEC = California Energy Commission
CEQA = California Environmental Quality Act
CFR = Code of Federal Regulations
DEHS = Department of Environmental Health
EPA = Environmental Protection Agency
IEPR = Integrated Energy Policy Report
MCLs = Maximum Contaminant Levels
MOU = memorandum of understanding
RCRA = Resource Conservation and Recovery Act
RWQCB = Regional Water Quality Control Board
SWRCB = State Water Resources Control Board
TDS = total dissolved solids
WDRs = Waste Discharge Requirements

3.8.5.2 ISEGS Methodology

In the ISEGS FSA/DEIS, BLM and CEC staff (Staff) reported on existing conditions and assessed impacts to soil and water resources in the same section. Staff evaluated the potential of the project's proposed water use to cause a substantial depletion or degradation of groundwater resources, including beneficial uses. Staff considered compliance with the laws, ordinances, regulations, and standards associated with the project components and location. Staff also considered whether there would be a significant impact under CEQA using the following impact criteria:

- Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding or substantial erosion or siltation on or off site?
- Would the project create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?
- Would the project place within a 100-year flood hazard area structures that would impede or redirect flood flows?

- Would the project violate any water quality standards or waste discharge requirements?
- Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?
- Would the project contribute to any lowering of groundwater levels in the groundwater wells of other public or private water users?
- Would the project contribute to any lowering of the groundwater levels such that protected species or habitats would be affected?
- Would the project cause substantial degradation to surface water or groundwater quality?

3.8.5.3 ISEGS Impacts

The Staff determined that construction, operation, and decommissioning of the ISEGS project could impact water resources. The CEC and the BLM have published the impacts listed below related to hydrology and water quality for the ISEGS project. Where impacts were identified, Staff proposed mitigation measures to reduce impacts to less than significant levels.

Construction Impacts

Water Use and Discharge

Two groundwater wells, one primary supply and one backup supply, would be drilled on the northwest corner of Ivanpah 1 for all water required for the construction and operation of ISEGS. A groundwater monitoring well would be installed approximately 2,300 feet northeast of the two supply wells to determine any changes in local groundwater levels. All construction and operational water would be extracted from these two wells with the exception of potable water. Estimated water volumes required for construction and operation of ISEGS are provided below in Table 3.8-3.

Table 3.8-3 Estimated Water Volumes Required for Construction and Operation of ISEGS

Construction Phase Water Use	Acre Feet
Potable	9.3
Construction (dust suppression, vehicle washing)	617.4
Hydrostatic testing	0.1
TOTAL CONSTRUCTION PHASE WATER USE	**626.8**
Operation (annual consumption)	
Potable	3.0
Heliostat Operation and Washing	73.5
Mirror Washing*	42.7
TOTAL ANNUAL OPERATIONAL WATER USE	**119.2**

*Mirror washing water would be recycled from heliostat process water

During the construction phase, potable water would be purchased and delivered from a source outside of the project area. During the operation phase, potable water would either be purchased and delivered from a source outside of the project area or pumped from one of the two new wells and purified.

Hydrostatic testing of the pipeline component would require up to 47,000 gallons of water. Discharge of wastewater used for equipment washing and hydrostatic testing would be required. Following the testing process, the water quality would be tested. If the hydrostatic test water were found to be contaminated, it would be transported to an offsite wastewater treatment plant for processing and disposal. If the hydrostatic test water passed an analytical water quality test, it would be allowed to percolate/evaporate on the ISEGS site, in compliance with the SWRCB permits requirements. With the use of BMPs and compliance with all laws, ordinances, regulations, and standards, the ISEGS FSA/DEIS concludes that there would be no significant impact from construction-generated wastewater.

Sanitary wastewater would be disposed of in an onsite septic and leach field system near the administration building in accordance with local and regional regulations. Residual sludge would be removed by a disposal service. Portable toilets at each power block area would be serviced by a local waste management company. No wastewater would be discharged off site.

Groundwater supply could be impacted by water use associated with ISEGS. During construction, groundwater would be used for dust suppression and hydrostatic testing of the pipeline component. To minimize impacts to groundwater resources, the Staff would require ISEGS to comply with SOIL&WATER-3, -4, and -6, described in Section 3.8.5.4, "ISEGS Conditions of Certification / Mitigation Measures." The project would use air-coolers and recycle the maximum amount of process water in an effort to minimize freshwater extraction from local groundwater resources.

Due to the distance, upgradient aspect, and ephemeral nature of the seeps and springs, the ISEGS FSA/DEIS concludes that groundwater extraction associated with construction of the proposed project would not result in significant impact to seeps or springs.

Extraction of groundwater can cause an existing source of contamination, such as the Molycorp Mine evaporation pond plume on the Ivanpah Dry Lake, to change behavior. If the extraction of groundwater were to change the topography of the subsurface water table, it could result in the plume flowing in a different direction. The applicant conducted groundwater modeling to determine whether groundwater extraction related to construction and operation of the ISEGS project would result in changes to the gradient and velocity of the evaporation pond plumes. The study concluded that changes would be negligible; therefore, the ISEGS FSA/DEIS concludes that the project would not result in significant impacts to water quality or remediation efforts.

Operational Impacts

The operational impacts to groundwater resources are consistent with the construction impacts described above or the ISEGS project. Operational process water would be treated in an oil/water separator and then stored for later treatment and use in the steam boiler. Process water would be reused to the extent practical. During operation, groundwater would be used for the power plant process and routine washing of solar panels. To minimize impacts to groundwater resources, the Staff would require ISEGS to comply with SOIL&WATER-3, -4, and -6, described in Section 3.8.5.4, "ISEGS Conditions of Certification / Mitigation Measures."

Operation of ISEGS could result in degradation of water quality due to discharge of eroded sediments, release of hazardous materials, and use of recycled process plant water for mirror washing. In addition, recycled mirror washing water would introduce certain mineral compounds. The applicant calculated that only minor mineral buildup would develop on site and no wastewater would flow off site. Degradation of water quality could occur if the ISEGS project were to cause an increase in suspended sediment load in stormwater. Likewise, if erosion control measures were too limiting, they could reduce the amount of sediment transported to the Ivanpah Playa relative to preconstruction conditions. The ISEGS applicant concluded that the project would not result in any net change in sediment transport to downstream features. The Staff performed their own sediment transport model and reached the same conclusion. They concluded that there would be no net change in sediment transfer because there would not be a significant increase in stormwater velocity, and that stormwater flowing into the site is typically carrying a full sediment load and therefore is unable to suspend more material.

Operation of ISEGS could result in increased stormwater runoff due to modifications of natural precipitation patterns. In addition, recycled mirror washing water would introduce more water than is normally present on the site. This could result in more downstream flooding. Natural precipitation patterns would be modified by the proposed project.

The ISEGS applicant would implement low impact development principles in their stormwater design plan. The proposed stormwater plan would maintain natural drainage features and patterns to the maximum extent practicable. Stormwater and sediment control plans would be consistent with San Bernardino County, FEMA, and Clark County guidelines. Around power blocks, the ISEGS applicant would construct embankments, fill, and drainage channels to divert flow around the blocks, preventing scour. The roughness and infiltration potential of the ground affects the volume and speed of stormwater flow. Earthmoving, compaction, and use of dust suppression during the construction, operation, and decommissioning of ISEGS could modify the potential of the ground to slow and accept stormwater.

The applicant proposes to use vehicles with low impact tires or tracks to prevent excessive compaction from vehicle travel. However, the ISEGS FSA/DEIS states that, even with these measures, compaction due to vehicle travel would likely increase erosion. The ISEGS applicant conducted modeling of stormwater runoff during a 100-year storm event and concluded that peak flow would increase by 4.48 percent and overall discharge would increase by 1.68 percent as a result of the construction and operation of the ISEGS project. The ISEGS FSA/DEIS concludes that this would be a less than significant impact to local hydrology when compared with the volume and velocity of stormwater that flows onto the proposed project site.

Storm events could cause breakage of project components and transport of these materials downstream, resulting in impacts to water resources. Because the ISEGS project would be constructed using low impact development, there would be no mechanisms to divert stormwater away from heliostat fields. Heliostat units would be mounted on poles in relatively soft alluvium sediments that would be subject to scour and collapse during weather events. The heliostat structure, mirror, and wiring could be transported downstream. A perimeter fence would capture large pieces but small mirror fragments could be transported beyond the project site. The Staff conducted an analysis to determine the potential damage related to stormwater scour during 10- and 100-year storm events and concluded that these storms could result in the failure of 4,000 and 32,000 heliostats, respectively. Staff concluded that 6 to 9 feet of scour could occur at the project site during storm events. Staff requires the applicant to comply with Condition of Certification SOIL&WATER-5 (reinforcing heliostats to withstand up to 6 feet of scour) to minimize impacts from broken heliostat. By applying this Condition of Certification, the number of broken heliostats during 10- and 100-year events would be reduced to 10 and 50 heliostats, respectively.

With proper installation of poles to prevent failure, Staff concluded that effects of erosion and stormwater flow to water resources on and off the site can be mitigated through the implementation of Conditions of Certification SOIL&WATER-1, -2, and -5.

Discharge of wastewater can result in adverse effects to water resources. With the implementation of Conditions of Certification SOIL&WATER-7 and -8, the Staff concluded that no significant impacts to water resources would occur due to operation of the ISEGS project.

Decommissioning Impacts

The ISEGS project would be decommissioned at the end of its 50-year life by removing all facilities to 3 feet below grade, restoring original contours, and revegetating the site. The ISEGS FSA/DEIS states that this removal could cause “substantial disturbance” to water resources. However, with the adoption of the resource protection plans included in construction, the ISEGS FSA/DEIS concludes that impacts to water resources would be less than significant.

3.8.5.4 ISEGS Conditions of Certification / Mitigation Measures

The ISEGS FSA/DEIS recommends that the following Conditions of Certification be required by the CEC and the BLM to lessen impacts to hydrology and water quality if the project is approved. Since the ISEGS document presented water and soil resources in one section, the MMs listed below apply to both resource areas.

SOIL&WATER-1 requires the project applicant to develop a Drainage, Erosion, and Sedimentation Control Plan (DESCP) to ensure protection of water quality and soil resources.

SOIL&WATER-2 requires the applicant to develop an industrial SWPPP that meets the requirements specified in Appendices B, C, and D.

SOIL&WATER-3 requires the applicant to ensure compliance with state and local laws, ordinances, regulations, and standards during construction of the onsite groundwater wells.

SOIL&WATER-4 requires the applicant to limit construction water use to 100 AFY.

SOIL&WATER-5 requires the applicant to design the project such that the heliostats are reinforced to withstand 6 feet of scour. The applicant would develop a Stormwater Damage Monitoring and Response Plan, which would include a strategy to clean up and mitigate broken or transported heliostats. Also under this MM, the applicant would be required to establish a baseline and monitor for changes to the surface of Ivanpah Dry Lake. This MM also requires the applicant to develop standards and procedures for reassessing the proposed stormwater management plan if it does not perform as planned.

SOIL&WATER-6 requires the applicant to comply with San Bernardino County's Desert Groundwater Management Ordinance. This includes developing a groundwater-level monitoring and reporting plan and integrating with the Primm Valley Golf Course's existing groundwater monitoring and reporting program.

SOIL&WATER-7 requires the applicant to ensure that the collection and recycling of process wastewater would be managed in compliance with applicable laws, ordinances, regulations, standards, and BMPs.

SOIL&WATER-8 provides requirements for the installation of the proposed septic tank and leach field.

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